MAKING SAFE JERKY IN A HOME DEHYDRATOR

Dried meat, commonly called jerky, has been a popular food for thousands of years. Jerky has traditionally been made by drying meat at low temperatures (130°F -170°F) for a long period of time. These processing conditions can make it difficult to manufacture a safe product, especially using a home dehydrator. It is important to reach a sufficient temperature in the jerky-drying process to kill pathogens such as *Salmonell*a and *E. col*i *O157:H*7 which may contaminate the product.

Based on research begun at the University of Wisconsin in 1998 and continuing in 2009, the University of Wisconsin-Extension recommends that manufacturers of jerky using a home dehydrator follow these guidelines:

Preparing the Meat

- **Use only lean meat in excellent condition**. For jerky prepared from ground meat, use meat that is at least 93% lean. For whole muscle jerky, trim meat of excess fat and slice no thicker than ¼". Partially freeze meat to make it easier to slice. Slice the meat with the grain if you wish to prepare the chewy jerky preferred by most mid-western consumers. Always choose clean, non-damaged meat from deer or other wild game.
- **Maintain meat under refrigeration or keep frozen until use**. If marinating meat, do so in the refrigerator. Whole muscle jerky is most often marinated in an acidic mixture containing spices and seasoning. Jerky made from ground meat is not marinated, but is mixed with dry spices and cure before forming into strips. Research has shown that the spice and cure (nitrite) in marinades and dry seasoning mixes will help in the destruction of pathogens.
- **Keep raw meats and their juices away from other foods**. Store raw meats on a plate or bowl in the refrigerator to catch drips. Wash hands and surfaces with hot soapy water, and rinse with warm water, after handling raw meat. Sanitize cleaned and rinsed cutting boards with a solution of 1 teaspoon bleach per quart of water. Allow to air dry.

Setting up the Dehydrator

- **Determine the true temperature of the dehydrator or oven when it is operating empty**.
  Do not rely on the dehydrator's temperature settings. Determine your dehydrator's drying temperature using a dial-stem thermometer as follows:
  - For an oven or a horizontal air-flow dehydrator, place the thermometer inside the unit and close the door.
  - For a vertical air-flow dehydrator, stack 2 to 3 trays on the base and place the thermometer between the top 2 trays such that the dial is sticking out between the shelves.
  - Turn the dehydrator on to its maximum setting; set your oven to

Dial Stem Thermometer

155°F. Record the temperature once it has stabilized. In order to safely dry meat at home, your oven or dehydrator must be able to maintain a temperature of at least 145° to 155°F (see below).
    - Do not test the temperature when the dehydrator or oven has product in it. Evaporative cooling occurs as the product loses moisture and this will give you an inaccurate temperature reading.
- **Use only dehydrators with temperature control**. Do not use dehydrators with factory preset temperature that can't be controlled. Recent research at the University of Wisconsin-Madison (2008) has shown that dehydrators with factory-set temperatures that can't be adjusted, such as Nesco's *Jerky Xpress*, do not reliably produce a safe product and are not recommended.

Safe Drying Methods

In our research we tested 3 home-style dehydrators: the Gardenmaster (#1010) and Jerky Xpress (#28JX), both from Nesco/American Harvest, and the Excalibur (#3900).

Choose one of the following recommended drying methods:

- **Dry meat at 145° - 155°F for at least 4 hours followed by heating in a pre-heated 275°F oven for 10 minutes**. Drying meat at a temperature below 145°F will produce a product that looks done before it is heated enough to destroy pathogens, and before it has lost enough moisture to be shelf-stable. Only a few dehydrators currently on the market will maintain the necessary temperature of 145° - 155°F: the *Gardenmaster* by Nesco/American Harvest and the *Excalibur* are two such units. Each of these units has a large heating element, strong air flow, and adjustable temperature setting. Dry for at least 4 hours (6 hours is preferable) and remove jerky from the dehydrator. Place dried strips on a baking sheet, close together but not touching or overlapping. Heat in a pre-heated 275°F oven for 10 minutes to an internal temperature of 160°F – strips thicker than ¼" (when raw) may require longer to reach 160°F. In our research, strips removed from the oven were sizzling hot. Remove oven-heated samples from the oven, cool to room temperature, and package. Always include the post-drying oven-heating treatment as a safety precaution.
- **Steam or roast meat strips in marinade to an internal temperature of 160°F before drying; heat poultry to 165°F (internal temperature) before drying**. The USDA Meat and Poultry Hotline currently recommends this method for making safe jerky. The pre-heating step assures that any bacteria present will be destroyed before drying and a lower dehydrator temperature (130° to 140°F) can be used. After boiling, dehydrate meat for 4 to 6 hours. No post-dehydration oven-heating is necessary. Since it can be impossible to accurately measure the internal temperature of a thin strip of meat, consumers can boil meat in marinade (or water) for 5 minutes before drying. Unfortunately, this USDA-recommended method produces a dried, crumbly product that would be judged inferior by Wisconsin standards for chewy, flexible jerky.

Dried jerky can be stored for 1 to 2 months at room temperature; in the freezer for up to 6 months. Vacuum package jerky to extend the shelf life of jerky.

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